



DESCRIPTION

PT2604 is a tri-state remote control decoder IC utilizing CMOS Technology. It provides 10 address pins and 4 data pins. Code Format Compatible with HT604L, PT2604 is housed in 20 pins, DIP or SOP Package and supports the Latch Data Output Type. It may be paired with PT2607 to provide a powerful high performance remote control system. Pin assignments and application circuit are optimized for easy PCB Layout and cost saving advantage.

FEATURES

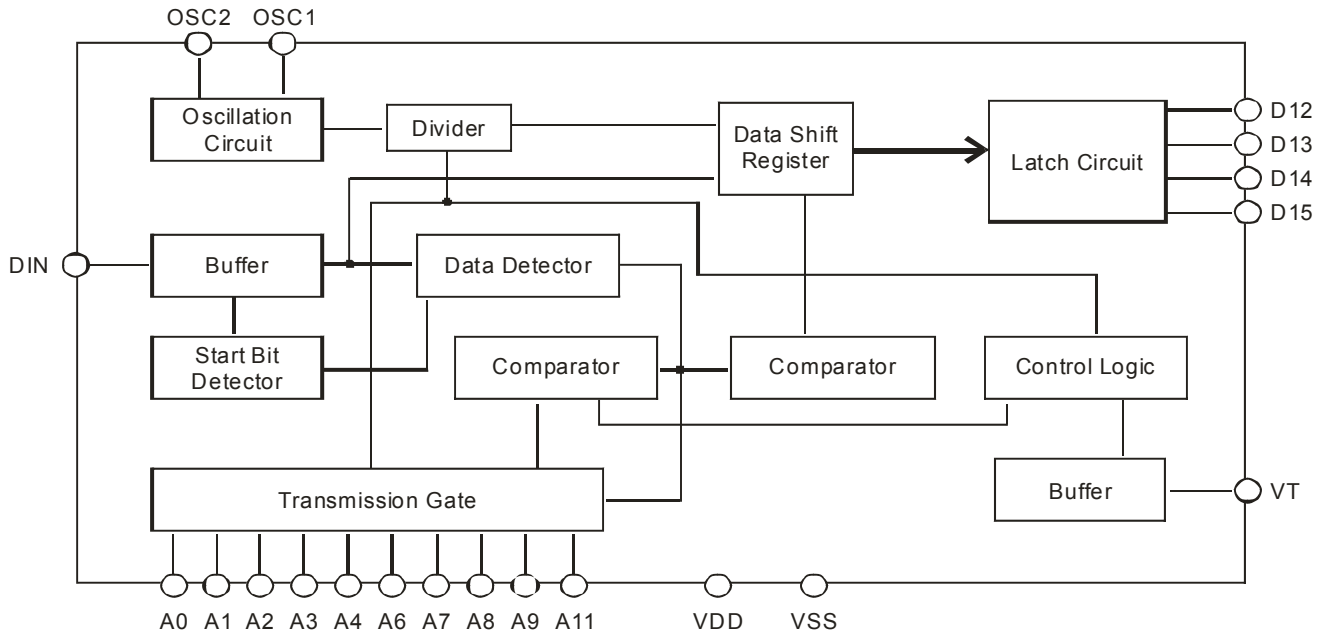
- CMOS technology
- Low power consumption
- Low standby current
- Operating voltage: 3 to 15V
- Provides 10 address pins & 4 data pins
- Built-in oscillator
- Latch data output type
- Least external components
- Easy to use
- Available in 20 pins, SOP or DIP
- May be paired with PT2607

APPLICATIONS

- Car/Motorcycle security system
- Home/Office security system
- Garage door remote controller
- Personal alarm system
- Cordless telephone
- Remote control for industrial use
- Remote switch

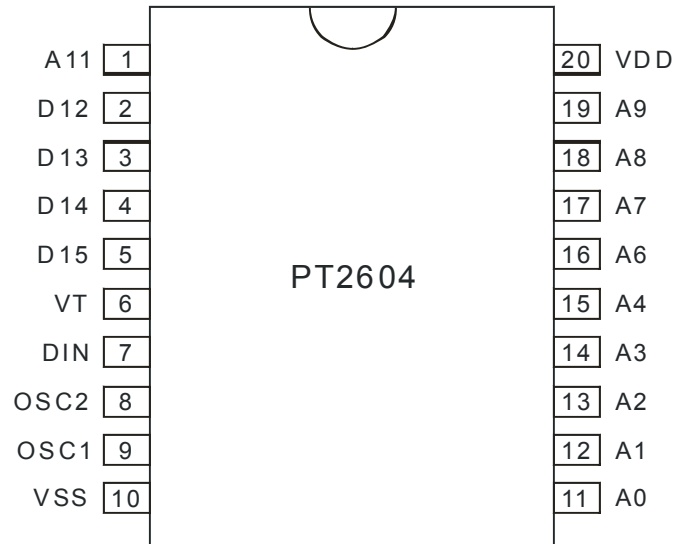


BLOCK DIAGRAM





PIN CONFIGURATION



PIN DESCRIPTION

Pin Name	I/O	Description	Pin No.
A11, A0 ~ A4, A6 ~ A9	I	Address Input Pins These pins may be externally set to "1", "0" or "f".	1, 11 ~ 15, 16 ~ 19
D12 ~ D15	O	Data Output Pin	2 ~ 5
VT	O	Valid Transmission Active High	6
DIN	I	Serial Data Input Pin	7
OSC2	O	Oscillator Output Pin	8
OSC1	I	Oscillator Input Pin	9
VSS	-	Negative Power Supply	10
VDD	-	Positive Power Supply	20



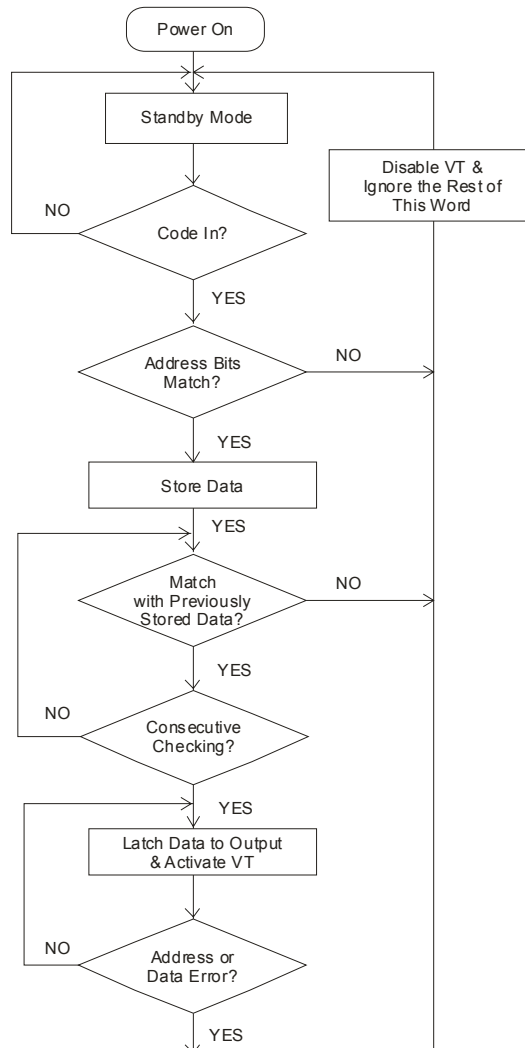
FUNCTION DESCRIPTION

PT2604 may be paired with our remote control encoder -- PT2607. When PT2604 receives data transmitted by encoders such as PT2607, it deciphers the 12 address bits and the 6 data bits. The DIN Pin Signal activates the oscillator which in turn decodes the incoming address and data bits. Please note under the Standby Mode, the oscillator is disabled. It is activated only if the DIN Pin is receiving data.

PT2604 then compares the address which was received twice in a consecutive manner with its local address. If all the data received match the local address of PT2607, the 6 bits of data are decoded and transferred to the output pins. The VT Pin then is set to "HIGH" to indicate a that transmission is valid until no signal or unmatched address codes are received. Please note the VT Pin is set to "HIGH" only when there is valid transmission, otherwise, it is in "LOW" State.

Please refer to the Operation Flowchart diagram.

OPERATION FLOWCHART



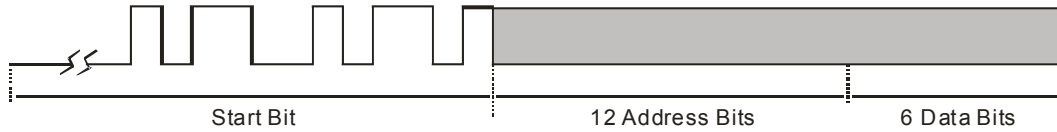


Remote Control Decoder IC

PT2604

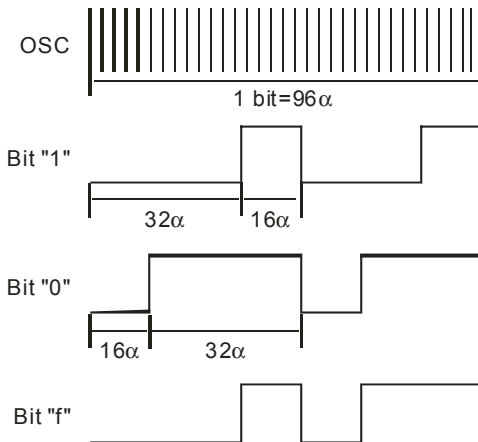
CODE WORD

A Code Word consists of a Start Bit, 12 Address Bits and 6 Data Bits. Please refer to the diagram below.



ADDRESS BITS & DATA BITS

Both Address and Data Bits can be designated as Bit “0”, “1” or “f”, if it is in “Low”, “High”, or “Floating” State respectively. One bit waveform consists of 2 pulse cycles. Each pulse cycle has 48 oscillating time periods. For further details, please refer to the diagram below.

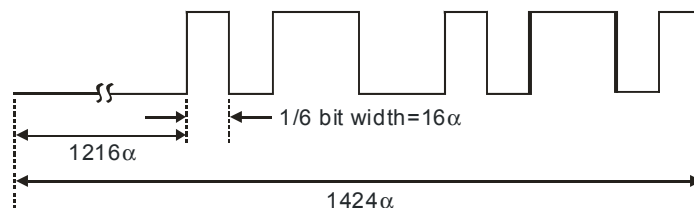


where: α =Oscillating Clock Period

The Data Input Floating State is interpreted as “LOW” by the decoders since the decoder output only provides for two states.

START BIT

The Start Bit consists of a pilot period ($1,216\alpha$), followed by a 1/6 bit width pulse and 2-bit.





Remote Control Decoder IC

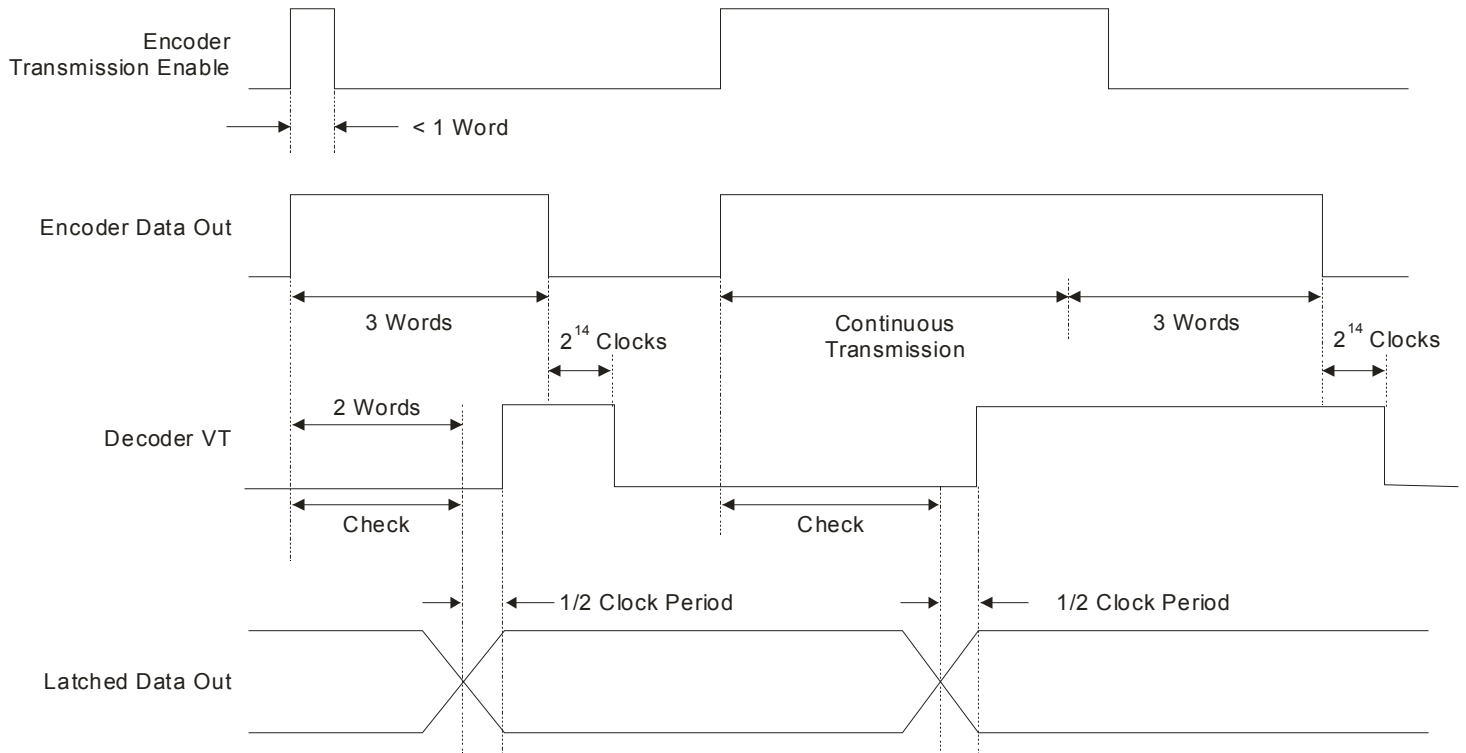
PT2604

ADDRESS & DATA BITS SEQUENCE

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A0	A1	A2	A3	A4	-	A6	A7	A8	A9	-	A11	D12	D13	D14	D15	-	-

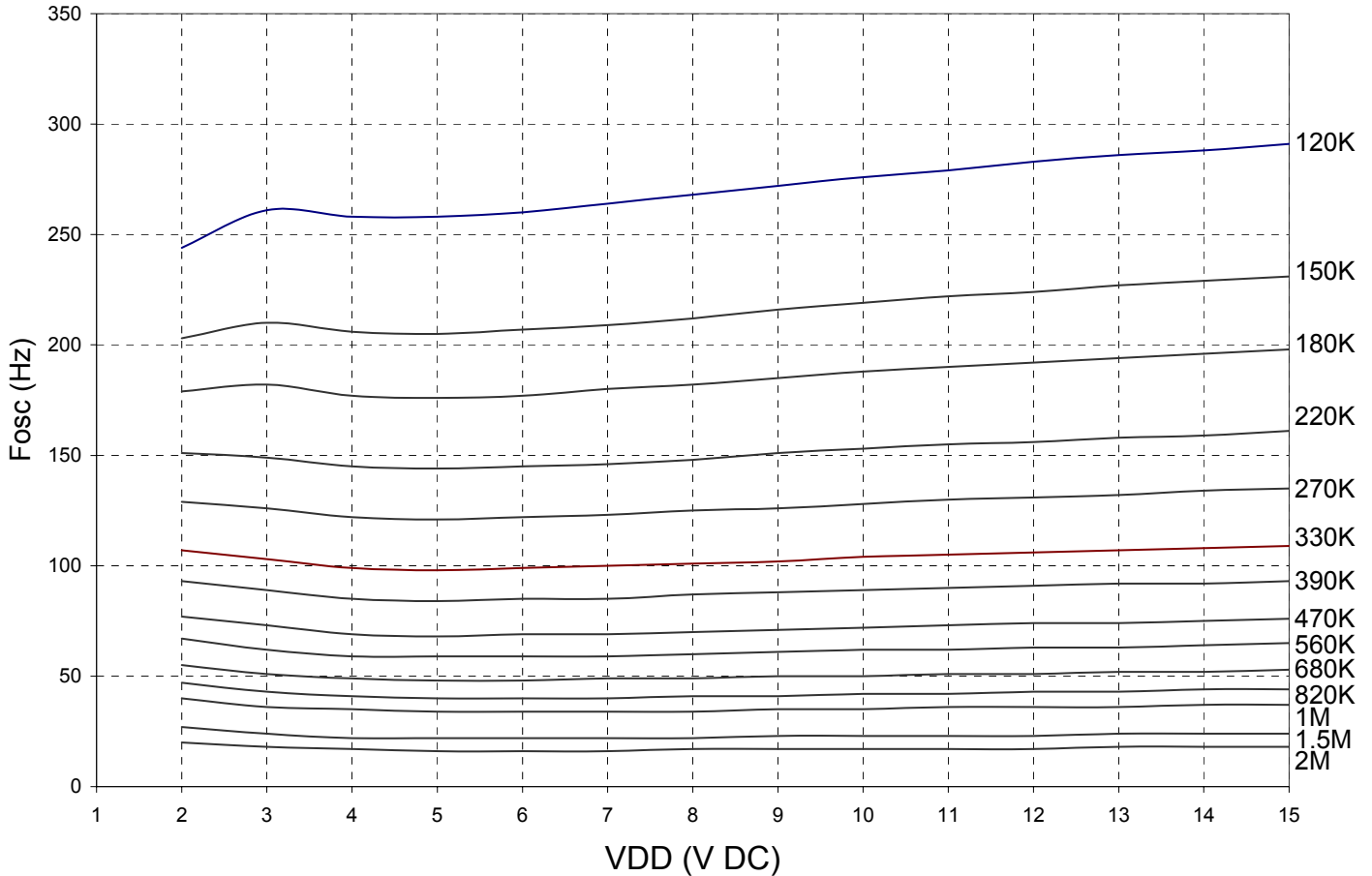
A5 (Bit 5), A10 (Bit 10), D16 (Bit 16) and D17 (Bit 17) are internally bonded and are floating.

DECODER TIMING





OSCILLATOR FREQUENCY VS. SUPPLY VOLTAGE



The Suggested Oscillator Resistor Values are shown below.

PT2607	PT2604
220KΩ	220KΩ
330KΩ	330KΩ
1MΩ	1MΩ

Note:

PT2604's VCC=3V to 15V and PT2607's VCC=3V to 15V

It is highly recommended that the oscillator frequency of the decoder be almost equal to that of the encoder - $f_{osc}(\text{decoder}) \cong f_{osc}(\text{encoder})$.



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Rating	Unit
Supply voltage	VDD	-0.4 ~ +17	V
Input voltage	VI	-0.3 ~ VDD+0.3	V
Output voltage	VO	-0.3 ~ VDD+0.3	V
Operating temperature	Topr	-40 ~ +85	°C
Storage temperature	Tstg	-65 ~ +150	°C

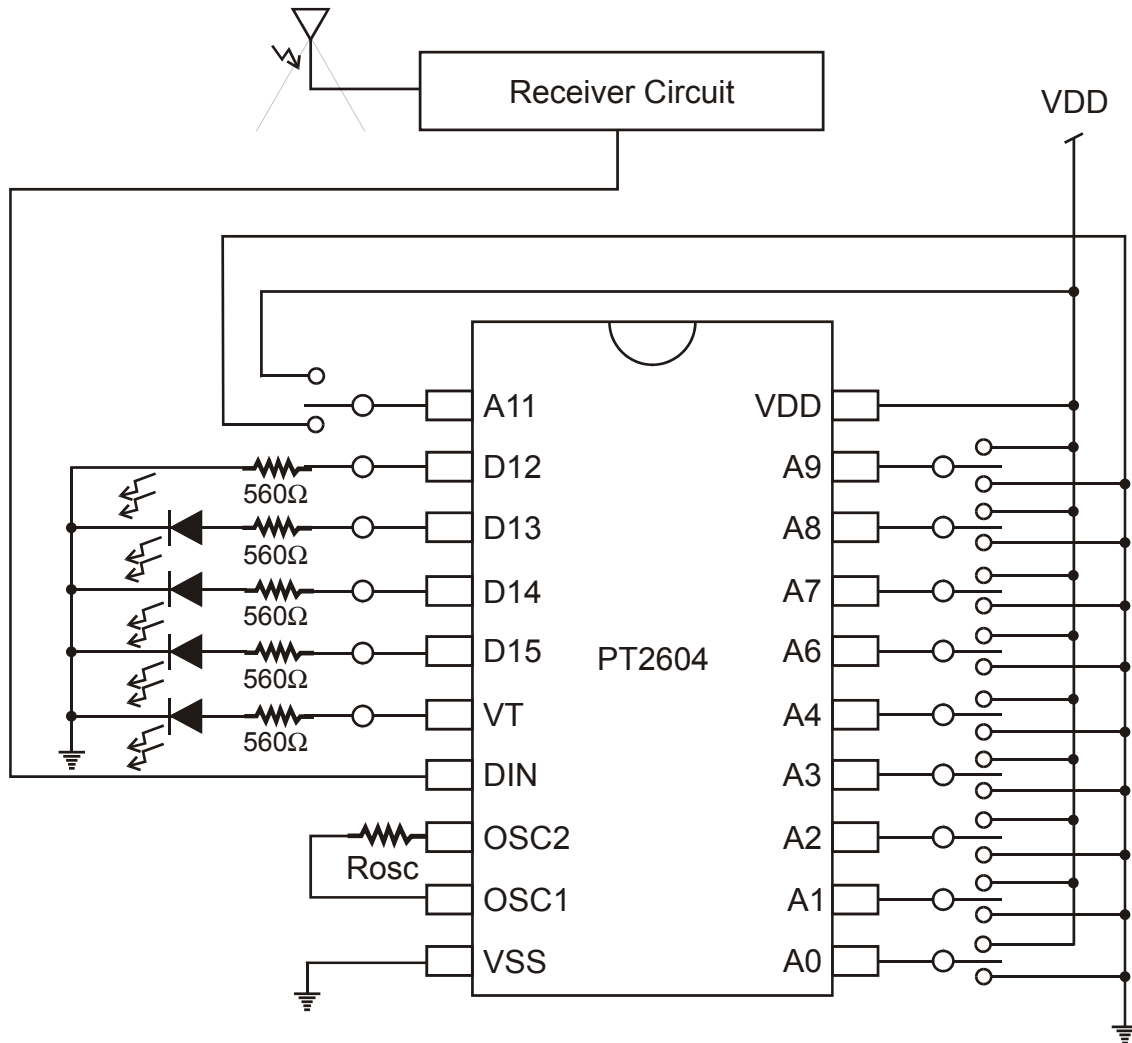
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating voltage	VDD		3	-	15	V
Standby current	ISB	VDD=5V, OSC stops	-	0.1	1	μA
		VDD=12V, OSC stops	-	2	4	
Operating current	IDD	VDD=5V, no load, Fosc=100KHz	-	-	1	mA
Data output source current (D10 to D17)	IO	VDD=5V, VOH=4.5V	-0.5	-1	-	mA
Data output sink current (D10 to D17)		VDD=5V, VOL=0.5V	0.5	1	-	mA
VT output source current	IVT	VDD=5V, VOH=4.5V	-2	-4	-	mA
VT output sink current		VDD=5V, VOL=0.5V	1	2	-	mA
High level input voltage	VIH	VDD=5V	3.5	-	5	V
Low level input voltage	VIL	VDD=5V	0	-	1	V
Oscillator frequency	Fosc	VDD=5V, Rosc=330KΩ	-	98	-	KHz
		VDD=10V, Rosc=330KΩ	-	104	-	
		VDD=12V, Rosc=330KΩ	-	106	-	



APPLICATION CIRCUIT





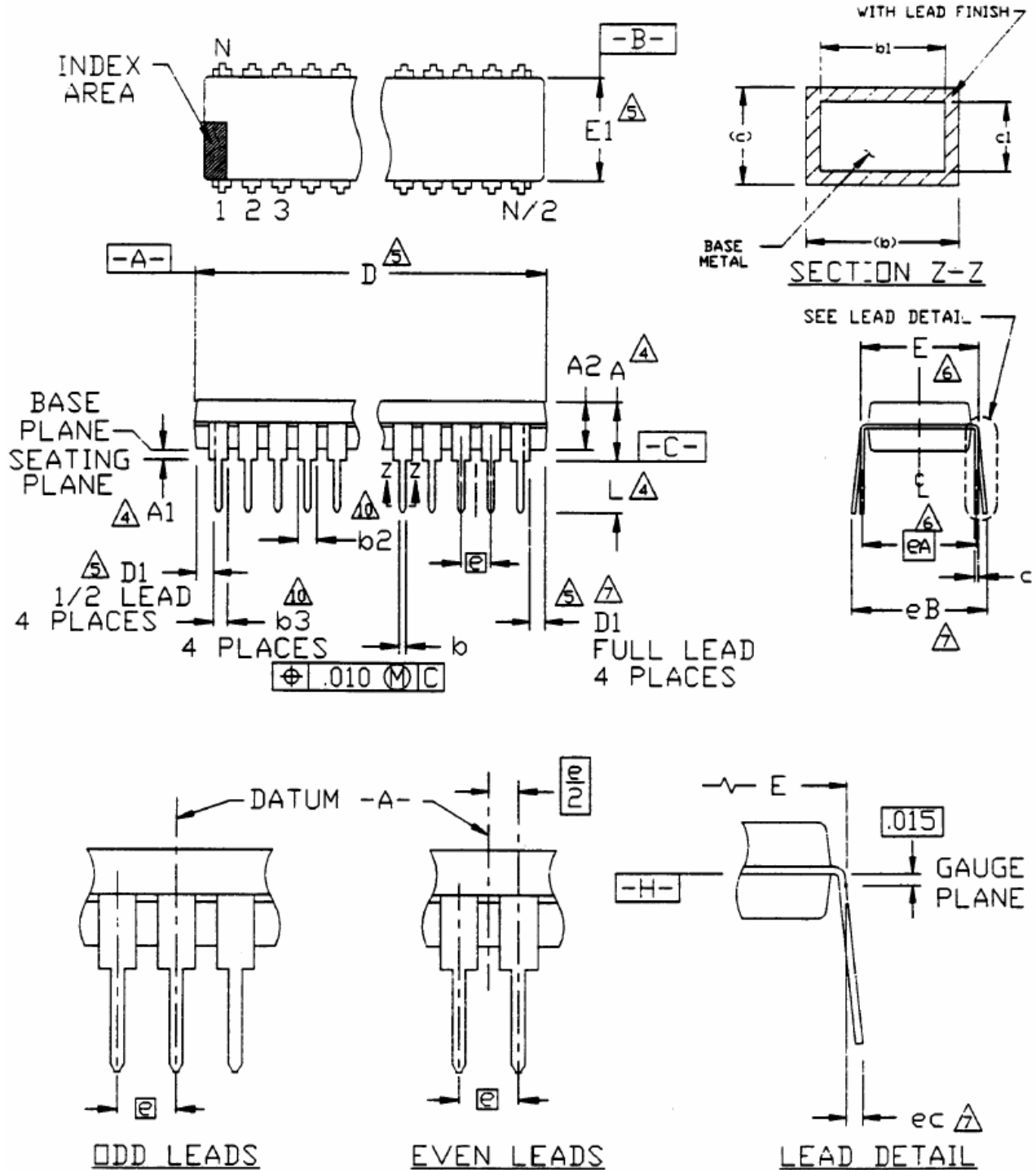
ORDER INFORMATION

Valid Part Number	Package Type	Top Code
PT2604	20 Pins, DIP, 300mil	PT2604
PT2604-S	20 Pins, SOP, 300mil	PT2604-S



PACKAGE INFORMATION

20 PINS, DIP, 300MIL





Symbol	Min.	Nom.	Max.
A	-	-	0.210
A1	0.015	-	-
A2	0.115	0.130	0.195
b	0.014	0.018	0.022
b1	0.014	0.018	0.020
b2	0.045	0.060	0.070
b3	0.030	0.039	0.045
c	0.008	0.010	0.014
c1	0.008	0.010	0.011
D	0.980	1.030	1.060
D1	0.005	-	-
E	0.300	0.310	0.325
E1	0.240	0.250	0.280
e	-	0.100 bsc.	-
eA	-	0.300 bsc.	-
eB	-	-	0.430
eC	0.000	-	0.060
L	0.115	0.130	0.150

Notes:

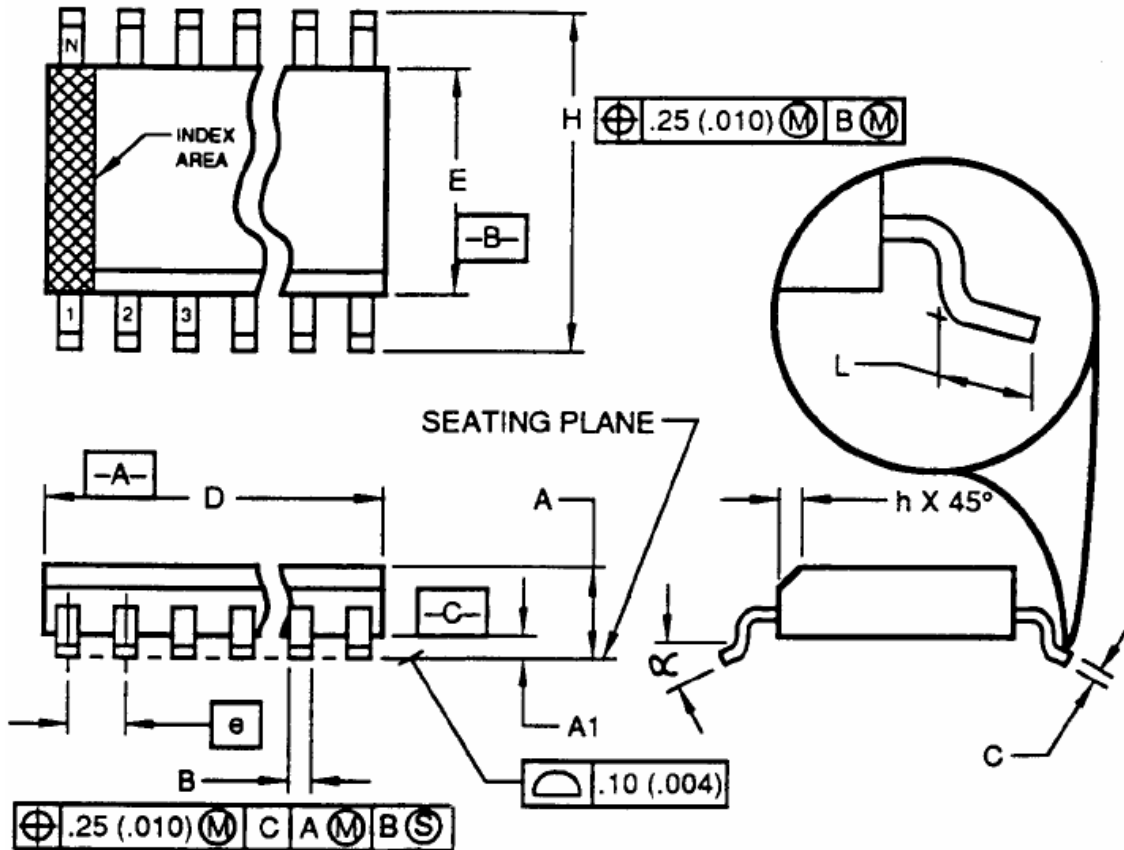
- All dimensions are in INCHES.
 - Dimensioning and tolerancing per ANSI Y14.5M-1982.
 - Dimension "A", "A1" and "L" are measured with the package seated in JEDEC Seating Plane Gauge GS-3
 - "D", "D1" and "E1" dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch.
 - "E" and "eA" measured with the leads constrained to be perpendicular to datum $\square\text{-C}$.
 - "eB" and "eC" are measured at the lead tips with the leads unconstrained.
 - N is the number of the terminal positions (N=20)
 - Pointed or rounded lead tips are preferred to ease insertion.
 - "b2" and "b3" maximum dimensions are not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm)
 - Distance between leads including dambar protrusions to be 0.005 inch minimum.
 - Datum plane $\square\text{-H}$ coincident with the bottom of lead, where lead exits body.
 - Refer to JEDEC MS-001, Variation AD.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.



Remote Control Decoder IC

PT2604

20 PINS, SOP, 300MIL



Symbol	Min.	Nom.	Max.
A	2.35	-	2.65
A1	0.10	-	0.30
B	0.33	-	0.51
C	0.23	-	0.32
D	12.60	-	13.00
E	7.40	-	7.60
e	-	1.27 bsc.	-
H	10.00	-	10.65
h	0.25	-	0.75
L	0.40	-	1.27
α	0°	-	8°



Remote Control Decoder IC

PT2604

Notes:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold Flash, protrusion or gate burrs shall not exceed 0.15 mm (0.006 in) per side.
 3. Dimension "E" does not include interlead flash or protrusions. Interlead flash or protrusions shall not exceed 0.25 mm (0.010 in) per side.
 4. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
 5. "L" is the length of the terminal for soldering to a substrate.
 6. N is the number of the terminal positions (N=20)
 7. The lead width "B" as measured 0.36 mm (0.014 in) or greater above the seating plane, shall not exceed a maximum value of 0.61 mm (0.24 in).
 8. Controlling dimension: MILLIMETER.
 9. Refer to JEDEC MS-013, Variation AC.
- JEDEC is the trademark of JEDEC SOLID STATE TECHNOLOGY ASSOCIATION.